

soon after it has fallen in most splendid waterfalls, some of which have a clear fall of 1500 feet.

We had no sooner accomplished the ascent than an impenetrable cloud of mist enveloped the whole of the upper part of the mountain, entirely obscuring the view, and rendering it difficult to see beyond forty or fifty yards in any one direction, and putting a limit to our wanderings.

After boiling the thermometer, which registered 197° F., the average of five readings, and gave the height (allowing for difference of temperature from sea-level) as 8600 feet, we returned to our hut, but not before I had tried with true British instinct to carve my initials as a memento of our visit; but I found the rock far too hard to permit of this, and had to content myself with leaving an advertisement torn from a newspaper of Messrs. Pears' soap and Madame Patt's testimony of its suitability for the hands and complexion.

In conclusion, I beg to present the Society with a few samples of rock and rounded pebbles, which I obtained in the course of our journey up the mountain. I have been told they lead to no very definite conclusion in a geological sense, as they seem to belong to no particular geological epoch, but are apparently agglomerations of deposits from various causes.

No fossils have been found, but several of these smooth pebbles which I found imbedded in the living rock on the summit point to its having been submerged at some long-passed time, but whether this huge mass has been obtruded by volcanic action, or the cliff has been bared of its at one time circumjacent soil by glacial or aqueous action, I leave for those skilled in geology to discuss, and shall be happy to give any further information that may lead to a more definite conclusion as regards the formation and age of the mountain.

One word more and I have finished: it is to again remind you that the whole success of the expedition is due to Mr. Im Thurn's excellent management and indefatigable zeal, as well as his intimate knowledge of the Indian character; and if my short notes have aroused your interest in Mount Roraima, I must ask you to accord a larger portion of the same to his complete and detailed report, which I have no doubt will ere long arrive.

NOTES

It is well known to all acquainted with the British Museum, that the staff of the Zoological Department is very insufficient for the needs of so large a collection. In the vast subject of entomology especially the number of assistants is quite out of proportion to the mass of material necessarily accumulating with the advance of geographical exploration. We are glad to learn that a step towards remedying this state of things is about to be taken by the addition to the staff of an assistant, to be specially engaged upon the collection of Coleoptera. The conditions upon which the appointment will be filled up are announced in our advertising columns.

THERE seems to be at last some chance of the great Hume collection being received by the nation, as the British Museum has sent Mr. Bowdler Sharpe to Simla to pack and despatch the collection to England. Mr. Sharpe started by the last mail via Brindisi, and expects to be absent from England about four months.

DR. BENJAMIN APTHORP GOULD is to return to the United States very soon from South America, where he has recently completed the great works upon which he has been engaged for so long at the Observatory of Cordoba. His fellow-citizens of Boston, *Science* states, propose to give him a reception and a dinner on his return.

ON May 13 a statue of Linnæus will be publicly unveiled at Stockholm. The day will be the 178th anniversary of his birth.

REPORTS from Japan state that grave fears were entertained of an outbreak of the long quiescent volcano Fujiyama, and that officials had been sent to investigate the matter. The people living in the neighbourhood believed an eruption to be imminent, because, while the snow on the mountain had begun to melt two months before the usual time, all the wells at the fort became dry, and difficulty was experienced in procuring water. The phenomenon is considered the more remarkable from the fact that the winter has been unusually cold, and that the surface of the snow remains hard, the part nearest the ground being the first to give way.

INTELLIGENCE has been received in Amsterdam from Java of the eruption of the Semiroo mountain, the largest and most active of the Javanese volcanoes, situated on the confines of the Passoorcan and Probolingo residencies. No mention is made of any loss of life having occurred.

PROF. FOREL, of Geneva, has sent us an account of an earthquake observed in Switzerland on April 13 last. It was composed of a preliminary shock at Neuchâtel between 9 and 10 o'clock, of a principal or great shock at 11.23 a.m., and of a succeeding shock observed at Lausanne and Geneva at 3.55 p.m. The principal shock disturbed a considerable area. It was felt in the district bounded by Geneva, Saint-Cergues, the Joux valley, Neuchâtel, Souceboz, Aarau, Schwyz, Interlaken, the Bernese Alps, Bex, and the Lake of Geneva. The detailed reports from the other cantons, Valais in particular, will extend still more the area of disturbance, which already includes a district 220 kilometres long by 100 broad, representing a superficial area of more than 20,000 kilometres. The main axis of disturbed surface is parallel to the chain of the Alps; in seismological classification this earthquake would therefore be put under the classification of longitudinal earthquakes. Over the disturbed area the shock was felt unequally. Thus in the cantons of Vaud and Neuchâtel, the district which Prof. Forel is appointed to study, numerous and precise observations were received from Enhaut, Ormonts, the Rhone valley, the shores of the Lake of Geneva, from Villeneuve to Morges, then from Ginguis, Saint-Cergues, l'Orient de l'Orbe, Neuchâtel, Souceboz, &c., while none at all came from the valley of the Broil or of the Thièle, nor from Gros du Vaud. It would seem that the centre of the district remained quiet, while the borders were disturbed. The intensity of the shock was greater as one approached the centre, which was probably the valley of the Haut Simmenthal. There some damage was effected in the walls of houses; it is even said that rocks were detached from hills. This would represent a shock No. 8 in the scale which represents the intensity of earthquakes in ten numbers. In Prof. Forel's district the earthquake had very little intensity. The shock had three undulations, with some seconds' interval between each. In general the direction of the oscillations was indicated as parallel to the meridian, from north to south, or, according to the localities, as coming from north east or north-west. A subterranean sound was heard in several places.

AT the conclusion of an article in a recent number of *Globus* on the Andalusian earthquake, Herr Willkomm refers to previous earthquakes observed in Southern Spain; for, although that of Christmas day last is the greatest and most frightful of them all in the historical period, it is by no means singular in other respects. The provinces of the kingdom of Granada, those of the kingdom of Murcia to the east of the latter, and the province of Alicante belonging to the old kingdom of Valencia, have frequently been visited by earthquakes. At Cape Roquetas

hardly a year passes without one. Judging from past shocks, Granada and the neighbourhood of Torrevieja and Guardamar in the south of Alicante, are the two main earthquake centres. From the last the shocks extend along the coast as far as Malaga. The most violent occurred in 1518 and 1829. On November 9, 1518, the town of Vera in Almería was wholly destroyed, and in March, 1829, the towns of Guardamar and Torrevieja were converted into heaps of ruins. Malaga has been visited by earthquakes four times during the past century—viz. 1775 and 1777; October 8–10, 1790; January, February, and August, 1804, and August 4, 1841. In 1802, from January 17 to February 6, there were repeated shocks at Torre la Mota and Torrevieja; on July 9, 1822, at Cartagena, Murcia, and Alicante (over 200 shocks in twenty-four hours); on April 27, 1826, and until July of the same year, innumerable shocks in and around Granada. The whole population of Granada left the town and camped in the fields. Similarly for many other places in Southern Spain. If to all these be added the numerous earthquakes on the west of the peninsula, with centre at Lisbon, it will be clear that, next to Italy, no other part of Europe is so frequently visited by earthquakes as the south and west of the Iberian peninsula.

M. CAMBOU, a missionary in Madagascar, writes from Tamatave to *Cosmos* to report that on February 25, after a terrible cyclone, the coast of Madagascar, near Tamatave, was covered with pumice-stone and dust, in all probability, says M. Cambou, from the Krakatoa eruption. On March 28, 1884, similar pumice was found on the coast of Réunion. Subsequently, in the middle of May, the same phenomenon was observed on Mayotte, in the Mozambique Channel; and in September of last year it was noticed at Tamatave. Crystals of feldspar were mixed with the amorphous matter. The stones were generally small, the edges being worn round by attrition. A very few were of a pale reddish colour. According to the course of the currents in the Indian Ocean these would have been carried from the Straits of Sunda down to the 16th or 17th degree of south latitude in a south-westerly direction. Thence they reached Madagascar, and the adjacent islands, through the agency of the equatorial current and the trade-winds. The probability that this pumice is that of the Krakatoa eruption is supported by the following facts: the American frigate *Penacola*, passing the Straits of Sunda on December 22, 1883, crossed large banks of pumice, and continued to sight smaller ones until January 10, 1884, when she was in 16° 7' S. lat. and 66° 8' E. long. The average speed of the current is stated to have been fifteen miles per day. Subsequently, on April 13, 1884, the French war-ship *Boursaint* met a bank of this pumice floating off the coast of Madagascar, in 14° 35' S. lat., and 48° 2' E. long. The circumstances under which this pumice reached the Malagasy coast are specially interesting to ethnologists, as they afford a new proof of the possibility of human migrations to considerable distances. They also give some support to the theory that the Hovas of Madagascar are of Malay descent.

THE Madrid Correspondent of the *Standard* writes that several doctors in Valencia have been making numerous experiments by inoculating adults and children with the choleraic virus. The faith of the local physicians and of persons of all classes in these experiments is so great that in one afternoon 300 persons were inoculated. The Scolapian Fathers brought all their pupils also for this preventive vaccination against cholera. The medical men say the same phenomena have been observed as were noticed in similar experiments in France last year during the epidemic. A commission of Madrid doctors has been sent to report on the experiments.

THE Executive Council of the forthcoming International Inventions Exhibition at South Kensington has issued a most useful

railway-guide and route-book, for the use of intending visitors. The district included is about forty miles in every direction around London, and the book gives for each station the number of trains daily, the fares, the average time occupied on the journey, the points at which to change for connection with the Exhibition, and the last two trains each day. It will be of great use to those numerous visitors who are not acquainted with the readiest and most convenient methods of getting from South Kensington to other parts of the metropolis and its suburbs.

WE have received the second edition of Marion's "Guide to Photography," the first edition of which we noticed on its appearance. The text contains various additions, needed to bring it abreast of the latest photographic improvements.

WE have received the Report of the Mason Science College, Birmingham, for the year ending "Founder's Day," February 23, 1885. The appeal issued last year for an additional endowment fund for scholarships and exhibitions, additions to the teaching staff, &c., has been met by subscriptions amounting to nearly 5000*l*. The free lectures to artisans appear to have been very successful, each lecture having to be repeated on account of the demand for tickets. It is interesting to notice that the chairman of the Academic Board reports that "the presence of ladies in the classes stimulates many qualities in the students, and encourages gentlemanly behaviour." Besides prizes in all five languages taught, the ladies have distinguished themselves in physics this year. The fees for the evening classes have been diminished by one-half, being now threepence each lecture.

THE National Fish Culture Association have transferred another large consignment of whitefish fry to the lakes in the Isle of Mull in order to further their acclimatization to the waters of this country. Hitherto many experiments have been tried in this direction, but with no success. The American Government are rendering valuable assistance in effecting their propagation and are watching the result of the endeavours now being made with keen interest.

THERE will shortly appear, published by the Clarendon Press, "The Flora of Oxfordshire," including the contiguous portion of Berkshire, by G. Claridge Druce, F.L.S., &c. Over half a century having elapsed since the publication of Walker's "Flora of Oxfordshire," the many changes in nomenclature, the subdivision of species, and the great advance in botanical knowledge, demand a new work on the subject. Mr. Alfred French long ago commenced one, and on his premature death, in 1879, his MSS. came into Mr. Druce's possession. At the request of the Director of the Botanical Department of the British Museum, he undertook its completion. The "Flora" is intended to be not only a catalogue of the county species, with their localities, but also a history of them, and of the botanists connected with the University and county. About 400 species and varieties, additional to those given in Walker and Sibthorp, will be enumerated, and something like 20,000 records have been made in visiting nearly every parish in the county. The comparative plant occurrences in the counties of Berks, Bucks, Warwick, Northampton, and Gloucestershire will be shown. Orders should be sent to Mr. G. C. Druce, 118, High Street, Oxford.

A "BEGINNERS' Star Atlas," by the Rev. T. E. Espin, with an introduction by Mr. J. A. Westwood Oliver, is in the press, and will be published shortly by Messrs. W. Swan Sonnenschein and Co.

IN a paper read before the Academy of Sciences of Berlin at a recent meeting, Dr. G. Hellmann continued a paper read previously on certain regularities in the states of the weather in successive seasons of the year. The author, from a long series

of observations, draws a conclusion contrary to the current belief—viz. that a mild summer follows a mild winter. He studied the warm summers of Berlin from the year 1719 in one particular aspect—that is to say, with special reference to the succeeding winters. He regards that summer as warm when the temperature in June, July, August, and September, or at least in three of those months, is above the normal. Fifty-two such summers occurred between 1719 and 1885. Unfortunately there were certain gaps in the observations which could not be filled up; but there was no break in the observations between 1755 and the present, in all 130 years of uninterrupted observation. During this period there were 45 warm summers, or a proportion of 1 : 2.89. But, as in the case of mild winters, there was no periodicity of three years. Thus after the hot summer of 1763 there was not another for 12 years, and at the beginning of the present century there were 19 successive years (1799–1817) without a single hot summer. But in the case of the summers, as in that of the winters, a certain grouping is observable. In the 52 warm summers, in 31 cases 2 hot summers followed each other in succession, “so that one may wager 596 to 404 that one hot summer will be succeeded by a second.” The influence of a hot summer on the succeeding autumn and winter (October to February) is that of these months 2.82 were too warm. For the individual months, with the exception of November, the probabilities are about equal. Given a summer with July, August, and September hot, and a cold January, a warm December and February may be expected. As a general rule two warm winter months may be expected after a hot summer. But warm summers differ: they do not last the same length of time, they have not the same intensity; and these variations exercise an important influence on the succeeding winter months. The author then discusses the cold winters of Berlin and the respective probabilities of the succeeding months being cold. The results of the whole investigation he sums up in three propositions arranged and stated as follows:—(1) A $\left\{ \begin{smallmatrix} \text{moderately} \\ \text{very} \end{smallmatrix} \right\}$ mild winter will most probably be succeeded by a $\left\{ \begin{smallmatrix} \text{cool} \\ \text{hot} \end{smallmatrix} \right\}$ summer.

(2) A $\left\{ \begin{smallmatrix} \text{moderately} \\ \text{very} \end{smallmatrix} \right\}$ hot summer will most probably be succeeded by a $\left\{ \begin{smallmatrix} \text{moderately mild} \\ \text{cold} \end{smallmatrix} \right\}$ winter. (3) A $\left\{ \begin{smallmatrix} \text{moderately} \\ \text{very} \end{smallmatrix} \right\}$ cold winter will most probably be succeeded by a $\left\{ \begin{smallmatrix} \text{cool} \\ \text{cold} \end{smallmatrix} \right\}$ summer.

THE additions to the Zoological Society's Gardens during the past week include a Suricate (*Suricata tetradactyla*) from South Africa, presented by Miss F. M. Savill; two Common Badgers (*Meles taxus*), British, presented by Lord Willoughby de Broke; a Common Marmoset (*Leopoldus jacchus*) from Brazil, presented by Miss Henderson; a Cereopsis Goose (*Cereopsis nova-hollandiae*), a Black Swan (*Cygnus atratus*) from Australia, presented by Mr. F. L. Frodsham; a Mealy Amazon (*Chrysotis farinosa*) from South America, presented by Mr. W. Hodder; two Alligators (*Alligator mississippiensis*) from the Mississippi, presented by Mr. Charles Ridley; an Alligator (*Alligator mississippiensis*) from the Mississippi, presented by Miss Heimlicher; a Red-tailed Amazon (*Chrysotis erythrura*) from Brazil, three Upland Geese (*Bernicla magellanica* ♂ & ♂) from the Falkland Islands, three Wigeons (*Marca penelope* ♂ & ♂), European, purchased.

OUR ASTRONOMICAL COLUMN

OCCULTATION OF ALDEBARAN ON MAY 15.—The ephemerides do not take cognisance of occultations of the brighter stars, when near to the sun's place, nor indeed, as a rule, of occultations generally which occur whilst the sun is above the horizon of the place to which the calculations are adapted. In the

Monthly Notices of the Royal Astronomical Society for March, 1868, is a note communicated by Mr. R. S. Newall, drawing attention to an occultation of Aldebaran on May 22 in that year, when the star was little more than 8° distant from the sun, and suggesting that observation would be possible with a good equatorial, and, at any rate, would be worth trying, merely as a matter of curiosity. It does not appear from the succeeding numbers of the *Monthly Notices* that the occultation in question was anywhere observed, but on May 15 in the present year one of the same star will take place when its distance from the sun is 14½°, and some observers may be inclined to make an attempt to record the phenomenon. At the Royal Observatory, Greenwich, the star escapes occultation; in the north of England and in Scotland the times for the various observatories are as follow:—

	Disappearance			Reappearance		
	G.M.T.	Angle		G.M.T.	Angle	
	h. m.			h. m.		
Liverpool ...	2 50.0	19	...	3 5.7	353	
Stonyhurst ...	2 47.6	24	...	3 9.0	348	
Glasgow ...	2 39.6	38	...	3 10.1	334	
Edinburgh ...	2 37.9	39	...	3 14.2	334	
Duneech ...	2 35.3	45	...	3 16.9	328	

At Dublin the star disappears at 2h. 46.2m, G.M.T., and reappears at 3h. 1.0m.; angles 19° and 354° respectively, counted as usual in the *Nautical Almanac*.

VARIABLE STARS.—(1) Dr. Gould, in the *Uranometria Argentina*, enters into some detail with respect to the relative magnitudes of the bright stars in *Corvus*, to the discrepancies in estimating which Argelander first directed attention in vol. vii. of the “Bonn Observations.” It was considered that the Cordoba observations “served to remove all doubt as to the variability, within moderate limits, of all four of these stars, thus explaining the apparently contradictory nature of previous observations.” On the other hand, Mr. E. F. Sawyer, of Cambridgeport, Mass., says he carefully observed the bright stars of *Corvus* during the years 1882–84, and found that “β is certainly variable by nearly one magnitude, but that the other stars appear to be sensibly constant,” and he thinks the whole difficulty is thus solved. From Dr. Gould's remarks, however, there is room for doubt on this point.

(2) A minimum of R Leonis may be expected about May 26. The observations from 1840 to 1883 afford indications of the existence of a perturbation in the period.

THE DOUBLE-STAR γ EQUULEI.—The duplicity of this star was detected by Mr. G. Knott in 1867; his measures in that year give for 1867.543, position 276° 84, distance 2" 131. For the epoch 1877.728 Mr. Burnham found the position 274° 5, distance 2" 16. The annual proper motion of the principal star appears to be + 0.0027s. in right ascension, and – 0" 169 in declination, and if Mr. Knott's measures of 1867 are reduced to Mr. Burnham's epoch, with these values, they become—

Position 308° 0—Distance 3" 20, differing so widely from the Chicago results as to be strongly indicative of the binary character of the object.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, MAY 3–9

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on May 3

Sun rises, 4h. 30m.; souths, 11h. 56m. 42.0s.; sets, 19h. 24m.; decl. on meridian, 15° 48' N.: Sidereal Time at Sunset, 10h. 11m.

Moon (at Last Quarter on May 7) rises, 22h. 32m.*; souths, 3h. 0m.; sets, 7h. 27m.; decl. on meridian, 18° 17' S.

Planet	Rises	Souths	Sets	Decl. on meridian
	h. m.	h. m.	h. m.	
Mercury ...	4 17	11 25	18 32	12 28 N.
Venus ...	4 33	11 56	19 19	14 58 N.
Mars ...	3 59	10 51	17 43	9 27 N.
Jupiter ...	11 50	19 7	2 24*	13 56 N.
Saturn ...	6 32	14 39	22 46	22 11 N.

* Indicates that the rising is that of the preceding and the setting that of the following day.